

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: STREETWORKS

Report Number: P867984

Luminaire Tested: **MEM2-HSN-SA-100-750-U-T2U**

Issue Date: 08/21/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P867984  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: MEM2-HSN-SA-100-750-U-T2U  
Description: EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 100W 70CRI 5000K  
FITXURE w/ TYPE II URBAN DISTRIBUTION OPTIC  
Light Source: (20) 5000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

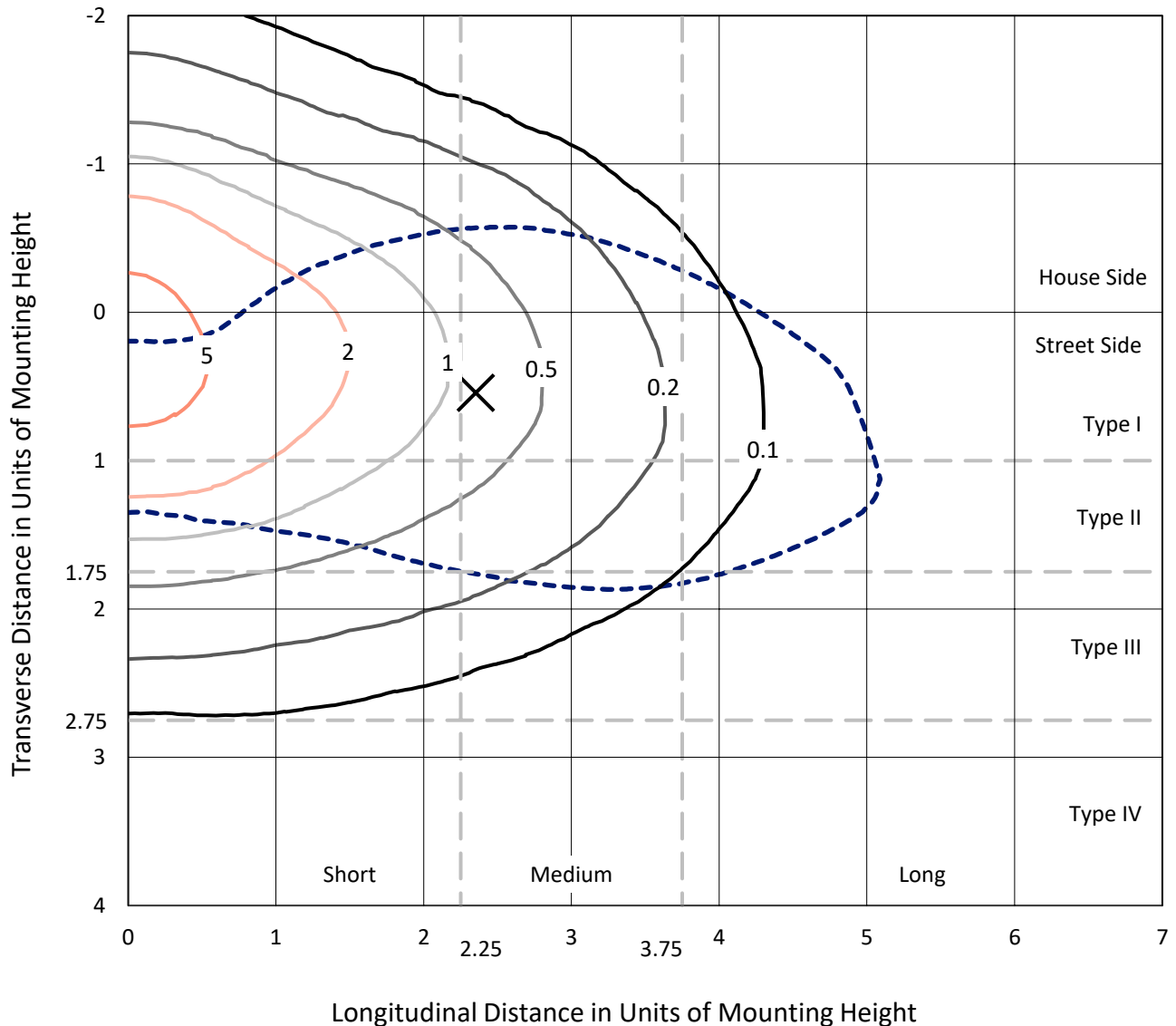
Lumens per Lamp: N/A  
Luminaire Lumens: 12773 lumens  
Efficiency: N/A  
Efficacy: 141.9 lumens/watt  
Luminous Opening: Rectangular (W 0.67' x L: 0.33' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G3

Input Watts (W): 90  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: 0.99  
Total Harmonic Distortion (THDi): 6.20%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

REPORT NUMBER: P867984  
 CATALOG NUMBER: MEM2-HSN-SA-100-750-U-T2U

### Iso-Footcandle Lines of Horizontal Illumination

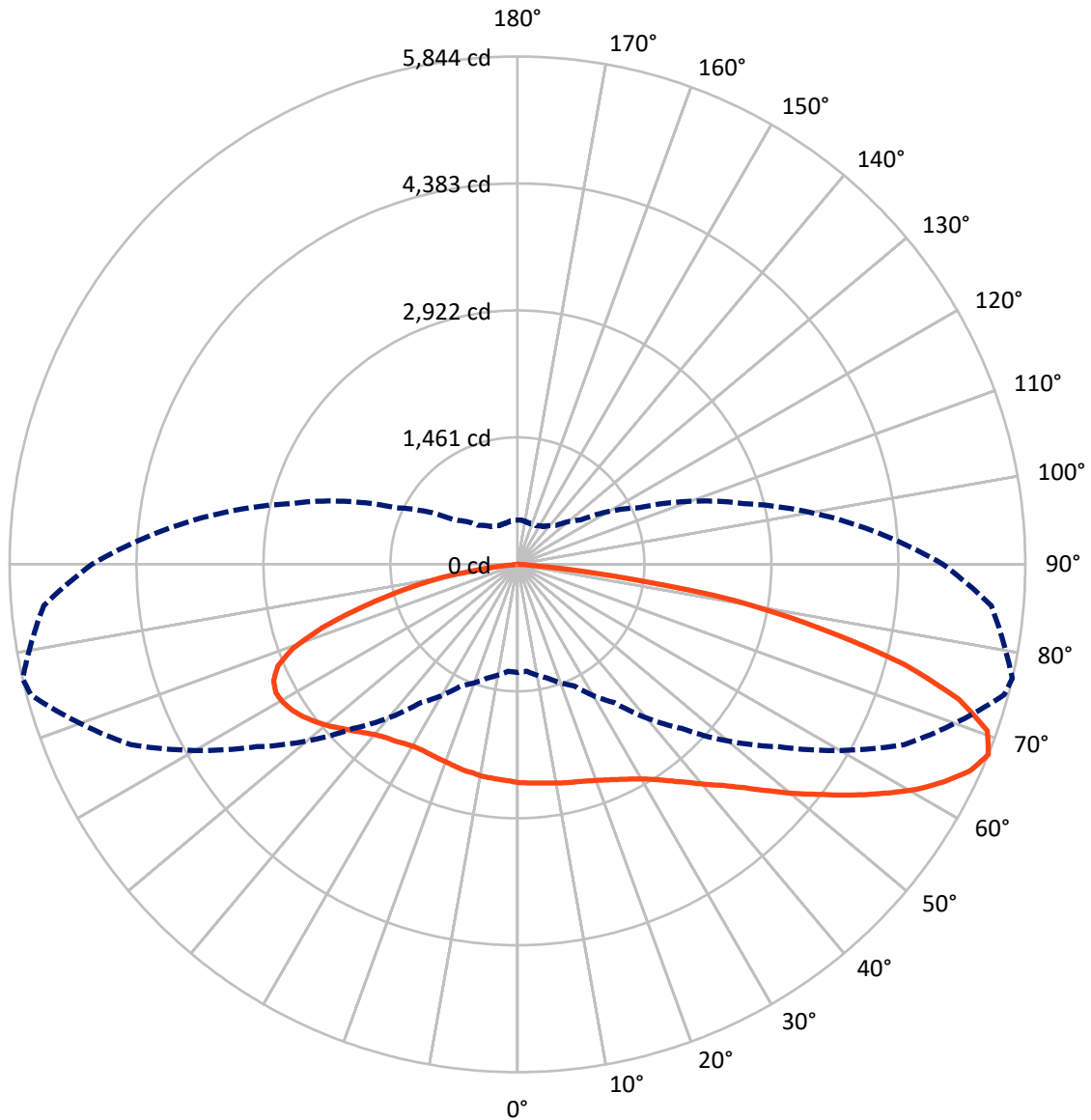
✕ Max cd  
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 6.9 fc  
 Type III - Medium - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 77-Deg Lateral    - - - Horizontal Cone Through 67.5-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 4247.5   | 0.0    | 4247.5  |
|                    | % Fixture | 33.3     | 0.0    | 33.3    |
| <b>Street Side</b> | Lumens    | 8525.5   | 0.0    | 8525.5  |
|                    | % Fixture | 66.7     | 0.0    | 66.7    |
| <b>Total</b>       | Lumens    | 12773.0  | 0.0    | 12773.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 241.4   | 1.9       |
| 10°-20°   | 732.0   | 5.7       |
| 20°-30°   | 1234.2  | 9.7       |
| 30°-40°   | 1751.3  | 13.7      |
| 40°-50°   | 2215.8  | 17.3      |
| 50°-60°   | 2427.3  | 19.0      |
| 60°-70°   | 2346.4  | 18.4      |
| 70°-80°   | 1578.1  | 12.4      |
| 80°-90°   | 246.6   | 1.9       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 12773.0 | 100.0     |
| 0°-180°   | 12773.0 | 100.0     |



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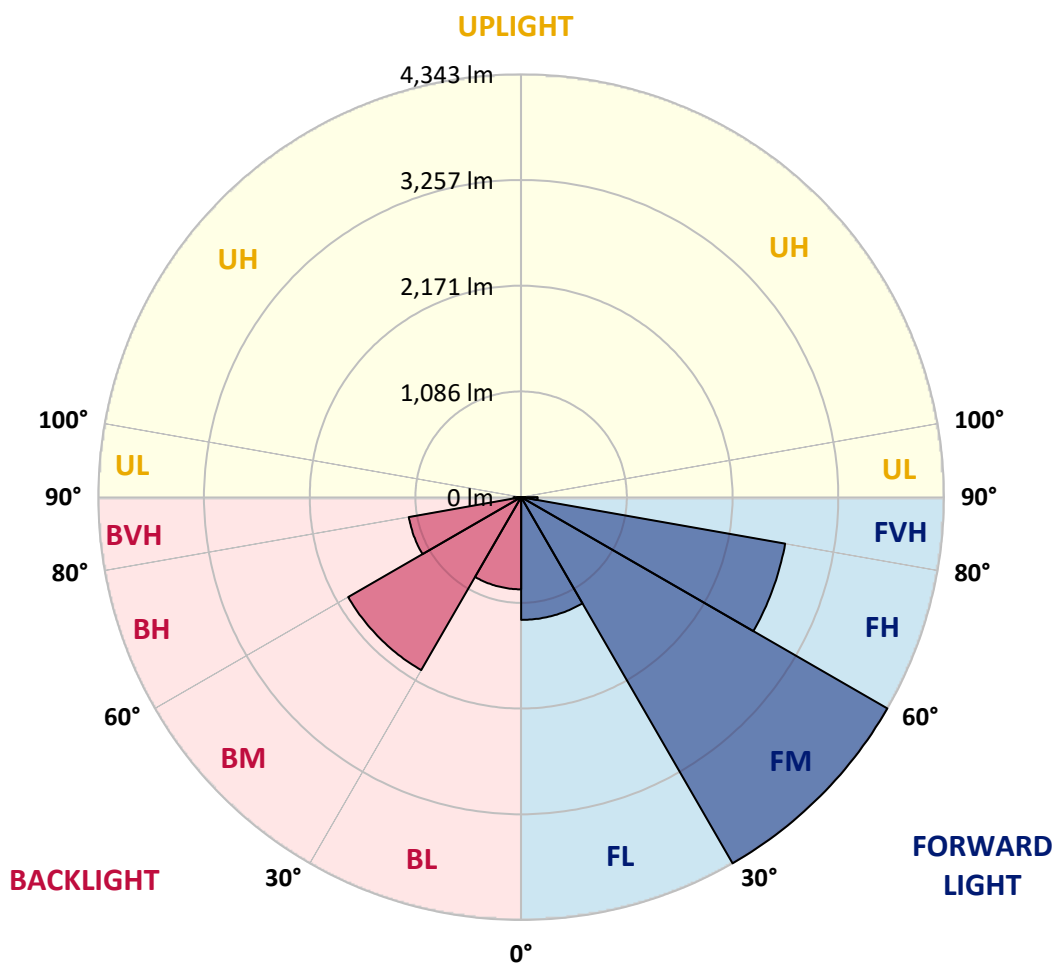
CATALOG NUMBER: MEM2-HSN-SA-100-750-U-T2U

**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 1260.7 | 9.9       |                         |      |         |
| FM (30°-60°)   | 4343.0 | 34.0      |                         |      |         |
| FH (60°-80°)   | 2753.0 | 21.6      |                         |      | G2/5000 |
| FVH (80°-90°)  | 168.9  | 1.3       |                         |      | G2/225  |
| BL (0°-30°)    | 946.8  | 7.4       | B2/1000                 |      |         |
| BM (30°-60°)   | 2051.4 | 16.1      | B2/2500                 |      |         |
| BH (60°-80°)   | 1171.5 | 9.2       | B3/2500                 |      | G3/2500 |
| BVH (80°-90°)  | 77.7   | 0.6       |                         |      | G1/100  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G3**

Type III Medium





REPORT NUMBER: P867984

CATALOG NUMBER: MEM2-HSN-SA-100-750-U-T2U

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 77°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2511.3 | 2511.3 | 2511.3 | 2511.3 | 2511.3 | 2511.3 | 2511.3 | 2511.3 | 2511.3 | 2511.3 | 2511.3 |
| 2.5°  | 2566.9 | 2564.4 | 2551.7 | 2556.8 | 2541.6 | 2551.7 | 2536.6 | 2523.9 | 2521.4 | 2518.9 | 2521.4 |
| 5°    | 2647.7 | 2635.1 | 2622.5 | 2614.9 | 2602.3 | 2597.2 | 2571.9 | 2546.7 | 2531.5 | 2529.0 | 2523.9 |
| 7.5°  | 2741.2 | 2736.2 | 2718.5 | 2708.4 | 2673.0 | 2655.3 | 2619.9 | 2574.5 | 2551.7 | 2541.6 | 2529.0 |
| 10°   | 2837.2 | 2849.9 | 2827.1 | 2806.9 | 2766.5 | 2728.6 | 2667.9 | 2609.8 | 2564.4 | 2559.3 | 2531.5 |
| 12.5° | 2956.0 | 2953.4 | 2938.3 | 2902.9 | 2854.9 | 2801.8 | 2728.6 | 2647.7 | 2587.1 | 2577.0 | 2536.6 |
| 15°   | 3062.1 | 3059.5 | 3039.3 | 3006.5 | 2943.3 | 2877.6 | 2779.1 | 2685.6 | 2609.8 | 2594.7 | 2546.7 |
| 17.5° | 3160.6 | 3155.6 | 3142.9 | 3107.6 | 3029.2 | 2948.4 | 2852.4 | 2728.6 | 2637.6 | 2619.9 | 2554.3 |
| 20°   | 3246.5 | 3251.6 | 3236.4 | 3201.0 | 3127.8 | 3041.9 | 2920.6 | 2784.2 | 2673.0 | 2652.8 | 2577.0 |
| 22.5° | 3340.0 | 3342.5 | 3334.9 | 3322.3 | 3228.8 | 3137.9 | 3006.5 | 2847.3 | 2713.4 | 2693.2 | 2602.3 |
| 25°   | 3438.5 | 3441.0 | 3446.1 | 3438.5 | 3332.4 | 3233.9 | 3094.9 | 2925.6 | 2769.0 | 2741.2 | 2637.6 |
| 27.5° | 3552.2 | 3554.7 | 3564.8 | 3549.7 | 3436.0 | 3332.4 | 3193.5 | 3009.0 | 2827.1 | 2796.8 | 2667.9 |
| 30°   | 3681.1 | 3691.2 | 3683.6 | 3678.5 | 3547.2 | 3446.1 | 3292.0 | 3094.9 | 2902.9 | 2865.0 | 2721.0 |
| 32.5° | 3835.2 | 3832.6 | 3817.5 | 3802.3 | 3668.4 | 3562.3 | 3403.1 | 3206.1 | 2996.4 | 2953.4 | 2806.9 |
| 35°   | 3946.3 | 3946.3 | 3923.6 | 3916.0 | 3792.2 | 3681.1 | 3524.4 | 3329.9 | 3102.5 | 3062.1 | 2897.9 |
| 37.5° | 4014.6 | 4024.7 | 4007.0 | 4012.0 | 3893.3 | 3789.7 | 3645.7 | 3456.2 | 3218.7 | 3183.3 | 3009.0 |
| 40°   | 4039.8 | 4065.1 | 4080.2 | 4100.5 | 3981.7 | 3893.3 | 3774.5 | 3592.6 | 3367.8 | 3327.4 | 3142.9 |
| 42.5° | 4044.9 | 4082.8 | 4135.8 | 4178.8 | 4044.9 | 3971.6 | 3898.3 | 3731.6 | 3514.3 | 3478.9 | 3289.5 |
| 45°   | 4019.6 | 4001.9 | 4130.8 | 4135.8 | 4080.2 | 4034.8 | 4007.0 | 3898.3 | 3726.5 | 3668.4 | 3471.4 |
| 47.5° | 3827.6 | 3807.4 | 3842.8 | 4004.4 | 4037.3 | 4062.6 | 4118.1 | 4092.9 | 3938.8 | 3893.3 | 3681.1 |
| 50°   | 3516.8 | 3506.7 | 3648.2 | 3822.5 | 3931.2 | 4060.0 | 4209.1 | 4279.8 | 4173.7 | 4145.9 | 3946.3 |
| 52.5° | 3004.0 | 2976.2 | 3264.2 | 3602.7 | 3792.2 | 4034.8 | 4272.3 | 4471.8 | 4439.0 | 4398.6 | 4173.7 |
| 55°   | 2678.1 | 2678.1 | 2872.6 | 3294.5 | 3615.4 | 3943.8 | 4312.7 | 4674.0 | 4732.1 | 4686.6 | 4433.9 |
| 57.5° | 2329.4 | 2357.2 | 2559.3 | 2849.9 | 3360.2 | 3777.1 | 4307.6 | 4843.2 | 5015.0 | 4972.1 | 4709.3 |
| 60°   | 2031.3 | 2054.0 | 2170.2 | 2463.3 | 3059.5 | 3557.3 | 4252.0 | 4982.2 | 5277.8 | 5262.6 | 4951.9 |
| 62.5° | 1728.1 | 1755.9 | 1849.4 | 2124.8 | 2662.9 | 3304.6 | 4135.8 | 5058.0 | 5525.4 | 5510.2 | 5196.9 |
| 65°   | 1485.6 | 1488.1 | 1581.6 | 1811.5 | 2266.2 | 2998.9 | 3931.2 | 5042.8 | 5717.4 | 5727.5 | 5404.1 |
| 67.5° | 1243.0 | 1235.4 | 1356.7 | 1543.7 | 1942.9 | 2670.5 | 3658.3 | 4908.9 | 5798.2 | 5843.7 | 5472.3 |
| 70°   | 914.6  | 924.7  | 1094.0 | 1301.1 | 1642.2 | 2291.5 | 3276.8 | 4648.7 | 5666.9 | 5737.6 | 5315.7 |
| 72.5° | 687.2  | 707.4  | 871.6  | 1086.4 | 1371.9 | 1912.5 | 2860.0 | 4196.5 | 5300.5 | 5310.6 | 4838.2 |
| 75°   | 558.3  | 563.4  | 709.9  | 901.9  | 1124.3 | 1533.6 | 2296.6 | 3504.2 | 4481.9 | 4598.2 | 4110.6 |
| 77.5° | 475.0  | 469.9  | 540.7  | 727.6  | 907.0  | 1225.3 | 1730.6 | 2665.4 | 3519.4 | 3572.4 | 3218.7 |
| 80°   | 404.2  | 401.7  | 427.0  | 588.7  | 709.9  | 874.2  | 1184.9 | 1857.0 | 2511.3 | 2569.4 | 2286.5 |
| 82.5° | 212.2  | 227.4  | 222.3  | 363.8  | 401.7  | 459.8  | 568.5  | 843.8  | 1096.5 | 1111.6 | 1051.0 |
| 85°   | 10.1   | 10.1   | 10.1   | 15.2   | 25.3   | 40.4   | 78.3   | 78.3   | 85.9   | 164.2  | 187.0  |
| 87.5° | 2.5    | 2.5    | 5.1    | 5.1    | 5.1    | 7.6    | 7.6    | 10.1   | 10.1   | 10.1   | 10.1   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



REPORT NUMBER: P867984

CATALOG NUMBER: MEM2-HSN-SA-100-750-U-T2U

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2511.3 | 2511.3 | 2511.3 | 2511.3 | 2511.3 | 2511.3 | 2511.3 | 2511.3 | 2511.3 | 2511.3 | 2511.3 |
| 2.5°  | 2516.4 | 2506.3 | 2491.1 | 2493.6 | 2491.1 | 2491.1 | 2478.5 | 2468.4 | 2465.8 | 2470.9 | 2481.0 |
| 5°    | 2518.9 | 2503.7 | 2481.0 | 2473.4 | 2465.8 | 2460.8 | 2440.6 | 2425.4 | 2417.8 | 2422.9 | 2425.4 |
| 7.5°  | 2518.9 | 2496.1 | 2470.9 | 2455.7 | 2435.5 | 2420.4 | 2397.6 | 2377.4 | 2367.3 | 2369.8 | 2374.9 |
| 10°   | 2513.8 | 2488.6 | 2468.4 | 2438.0 | 2405.2 | 2387.5 | 2352.1 | 2326.9 | 2314.2 | 2316.8 | 2304.1 |
| 12.5° | 2513.8 | 2486.0 | 2445.6 | 2417.8 | 2372.4 | 2334.5 | 2306.7 | 2278.9 | 2268.8 | 2258.7 | 2253.6 |
| 15°   | 2516.4 | 2481.0 | 2440.6 | 2382.5 | 2329.4 | 2289.0 | 2253.6 | 2235.9 | 2220.8 | 2215.7 | 2218.2 |
| 17.5° | 2516.4 | 2481.0 | 2420.4 | 2352.1 | 2291.5 | 2241.0 | 2210.7 | 2190.4 | 2185.4 | 2180.3 | 2180.3 |
| 20°   | 2529.0 | 2483.5 | 2402.7 | 2321.8 | 2246.0 | 2193.0 | 2165.2 | 2152.5 | 2152.5 | 2145.0 | 2145.0 |
| 22.5° | 2549.2 | 2488.6 | 2392.6 | 2296.6 | 2208.1 | 2150.0 | 2119.7 | 2104.5 | 2112.1 | 2107.1 | 2104.5 |
| 25°   | 2571.9 | 2506.3 | 2379.9 | 2261.2 | 2157.6 | 2097.0 | 2066.6 | 2056.5 | 2054.0 | 2041.4 | 2059.1 |
| 27.5° | 2589.6 | 2518.9 | 2372.4 | 2225.8 | 2112.1 | 2041.4 | 2003.5 | 1985.8 | 1973.2 | 1978.2 | 1973.2 |
| 30°   | 2637.6 | 2554.3 | 2374.9 | 2195.5 | 2061.6 | 1975.7 | 1930.2 | 1910.0 | 1905.0 | 1905.0 | 1905.0 |
| 32.5° | 2703.3 | 2599.7 | 2392.6 | 2182.9 | 2013.6 | 1912.5 | 1857.0 | 1836.7 | 1831.7 | 1821.6 | 1826.6 |
| 35°   | 2786.7 | 2667.9 | 2420.4 | 2162.7 | 1975.7 | 1839.3 | 1778.6 | 1750.8 | 1743.3 | 1733.2 | 1733.2 |
| 37.5° | 2880.2 | 2736.2 | 2440.6 | 2152.5 | 1925.2 | 1763.5 | 1695.3 | 1659.9 | 1654.8 | 1644.7 | 1649.8 |
| 40°   | 2998.9 | 2829.6 | 2473.4 | 2132.3 | 1867.1 | 1695.3 | 1604.3 | 1546.2 | 1558.8 | 1563.9 | 1574.0 |
| 42.5° | 3132.8 | 2948.4 | 2523.9 | 2112.1 | 1821.6 | 1624.5 | 1490.6 | 1432.5 | 1447.7 | 1442.6 | 1452.7 |
| 45°   | 3314.7 | 3087.3 | 2587.1 | 2104.5 | 1766.0 | 1538.6 | 1374.4 | 1308.7 | 1303.7 | 1296.1 | 1301.1 |
| 47.5° | 3504.2 | 3254.1 | 2647.7 | 2089.4 | 1705.4 | 1432.5 | 1243.0 | 1159.6 | 1139.4 | 1129.3 | 1119.2 |
| 50°   | 3701.3 | 3420.8 | 2718.5 | 2079.3 | 1624.5 | 1313.8 | 1111.6 | 1015.6 | 977.7  | 965.1  | 952.5  |
| 52.5° | 3923.6 | 3600.2 | 2779.1 | 2054.0 | 1536.1 | 1190.0 | 992.9  | 884.3  | 841.3  | 816.0  | 818.6  |
| 55°   | 4158.6 | 3764.4 | 2834.7 | 2023.7 | 1435.0 | 1073.7 | 874.2  | 783.2  | 740.3  | 732.7  | 732.7  |
| 57.5° | 4375.8 | 3933.7 | 2875.1 | 1970.6 | 1334.0 | 960.1  | 775.6  | 697.3  | 677.1  | 687.2  | 687.2  |
| 60°   | 4598.2 | 4070.1 | 2895.3 | 1912.5 | 1230.4 | 864.1  | 707.4  | 644.2  | 634.1  | 654.4  | 656.9  |
| 62.5° | 4777.5 | 4178.8 | 2890.3 | 1831.7 | 1116.7 | 780.7  | 641.7  | 591.2  | 596.2  | 631.6  | 639.2  |
| 65°   | 4906.4 | 4231.8 | 2827.1 | 1710.4 | 1008.1 | 707.4  | 583.6  | 535.6  | 535.6  | 560.9  | 568.5  |
| 67.5° | 4896.3 | 4163.6 | 2700.8 | 1541.1 | 891.8  | 634.1  | 530.6  | 492.7  | 492.7  | 510.3  | 507.8  |
| 70°   | 4689.1 | 3928.7 | 2460.8 | 1336.5 | 778.2  | 571.0  | 485.1  | 457.3  | 454.8  | 462.3  | 459.8  |
| 72.5° | 4191.4 | 3451.2 | 2086.9 | 1104.1 | 672.0  | 507.8  | 439.6  | 414.3  | 409.3  | 399.2  | 391.6  |
| 75°   | 3458.7 | 2834.7 | 1629.6 | 879.2  | 568.5  | 447.2  | 396.7  | 373.9  | 353.7  | 366.3  | 358.8  |
| 77.5° | 2683.1 | 2175.3 | 1212.7 | 682.1  | 462.3  | 389.1  | 353.7  | 328.4  | 323.4  | 368.9  | 353.7  |
| 80°   | 1958.0 | 1503.2 | 856.5  | 487.6  | 358.8  | 315.8  | 295.6  | 275.4  | 348.7  | 467.4  | 464.9  |
| 82.5° | 869.1  | 725.1  | 391.6  | 232.4  | 166.7  | 139.0  | 116.2  | 131.4  | 219.8  | 214.7  | 222.3  |
| 85°   | 78.3   | 80.8   | 42.9   | 27.8   | 17.7   | 15.2   | 10.1   | 10.1   | 7.6    | 7.6    | 7.6    |
| 87.5° | 10.1   | 10.1   | 7.6    | 7.6    | 5.1    | 5.1    | 5.1    | 5.1    | 2.5    | 2.5    | 2.5    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-157-6

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-40-750-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-40-750-U-5WQ-2

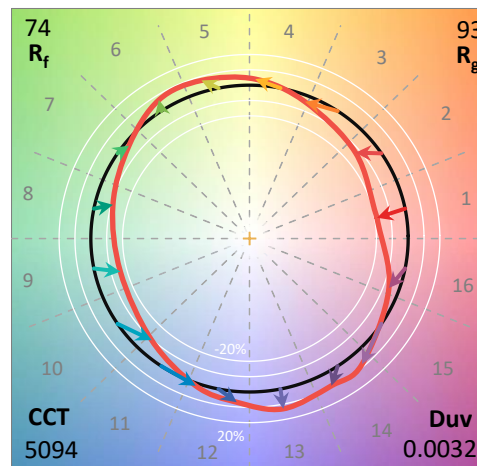
**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2407-157-6  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 08/20/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Streetworks  
 Catalog Number: **MEM2-HTN-SA-40-750-U-5WQ-2**  
 Description: Epic Modern Light Square 40W 5WQ Optic and Flare Trim

**Spectral Parameters**

CCT (K): 5094  
 CIE u': 0.2082  
 CIE v': 0.4867  
 Duv: 0.0032  
 CIE x: 0.3430  
 CIE y: 0.3564  
 CIE z: 0.3006  
 Peak Wavelength (nm): 451  
 Dominant Wavelength (nm): 568  
 Purity: 9.86439  
 Rf: 73.7  
 Rg: 93

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 72.0 |      |       |
| R1:       | 68.6 | R9:  | -39.6 |
| R2:       | 78.1 | R10: | 47.6  |
| R3:       | 84.6 | R11: | 68.2  |
| R4:       | 71.6 | R12: | 41.4  |
| R5:       | 69.6 | R13: | 70.4  |
| R6:       | 69.4 | R14: | 91.4  |
| R7:       | 80.9 | R15: | 61.4  |
| R8:       | 53.1 |      |       |



**Test Conditions**

Stabilization Time: 20M  
 Operation Time: 1H 20M  
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2407-157-6

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/18/2024        | 12/18/2024           |
| Power Meter                    | INXT2011004           | 2/8/2024         | 2/8/2025             |
| AC Power Source                | IN0063                | 10/24/2023       | 10/24/2024           |
| DC Power Source                | IN0208                | 10/24/2023       | 10/24/2024           |
| Sphere Thermometer             | IN0085                | 10/24/2023       | 10/24/2024           |
| Room Thermometer               | IN0046                | 10/24/2023       | 10/24/2024           |

REPORT NUMBER: SP1-2407-157-6

CIE 1931 Chromaticity Diagram



CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 5000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 114                      | NR            | 620    | 361                      | NR            | 750    | 9                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 145                      | NR            | 625    | 326                      | NR            | 755    | 8                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 197                      | NR            | 630    | 294                      | NR            | 760    | 7                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 259                      | NR            | 635    | 261                      | NR            | 765    | 6                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 319                      | NR            | 640    | 232                      | NR            | 770    | 5                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 373                      | NR            | 645    | 204                      | NR            | 775    | 4                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 414                      | NR            | 650    | 179                      | NR            | 780    | 4                        | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 445                      | NR            | 655    | 157                      | NR            | 785    | 3                        | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 465                      | NR            | 660    | 136                      | NR            | 790    | 3                        | NR            | 920    | 0                        | NR            |
| 405    | 5                        | NR            | 535    | 482                      | NR            | 665    | 118                      | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 9                        | NR            | 540    | 493                      | NR            | 670    | 102                      | NR            | 800    | 2                        | NR            | 930    | 0                        | NR            |
| 415    | 18                       | NR            | 545    | 505                      | NR            | 675    | 87                       | NR            | 805    | 2                        | NR            | 935    | 0                        | NR            |
| 420    | 36                       | NR            | 550    | 515                      | NR            | 680    | 75                       | NR            | 810    | 2                        | NR            | 940    | 0                        | NR            |
| 425    | 72                       | NR            | 555    | 527                      | NR            | 685    | 65                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 134                      | NR            | 560    | 540                      | NR            | 690    | 56                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 242                      | NR            | 565    | 550                      | NR            | 695    | 48                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 407                      | NR            | 570    | 557                      | NR            | 700    | 41                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 684                      | NR            | 575    | 561                      | NR            | 705    | 35                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 988                      | NR            | 580    | 559                      | NR            | 710    | 30                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 828                      | NR            | 585    | 551                      | NR            | 715    | 26                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 473                      | NR            | 590    | 537                      | NR            | 720    | 22                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 333                      | NR            | 595    | 516                      | NR            | 725    | 19                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 232                      | NR            | 600    | 491                      | NR            | 730    | 16                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 146                      | NR            | 605    | 461                      | NR            | 735    | 14                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 113                      | NR            | 610    | 429                      | NR            | 740    | 12                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 106                      | NR            | 615    | 395                      | NR            | 745    | 10                       | NR            | 875    | 0                        | NR            |        |                          |               |

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**Scotopic Flux vs. Wavelength**



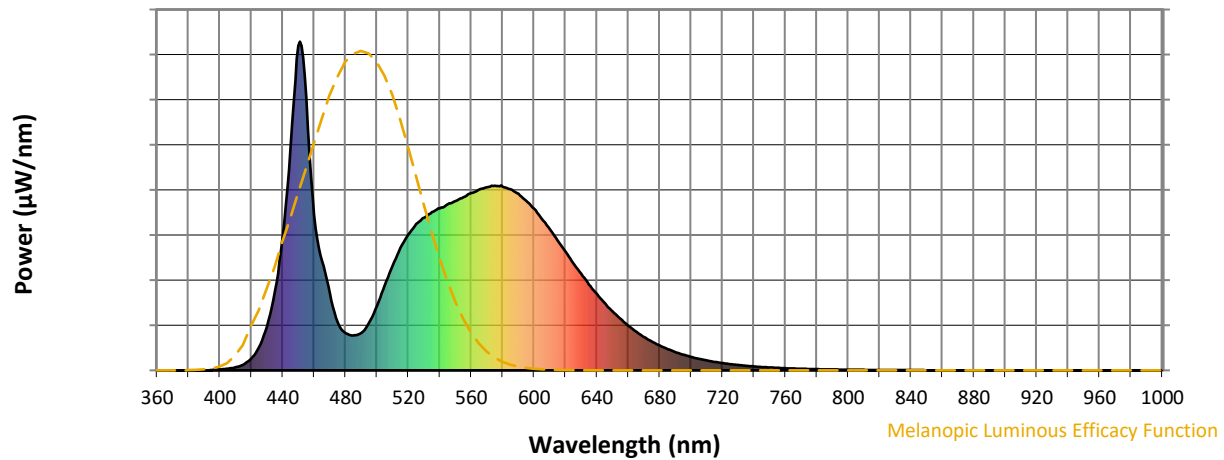
**Scotopic Lumens: NR**

**S/P: 1.81**

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 114                      | NR            | 620    | 361                      | NR            | 750    | 9                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 145                      | NR            | 625    | 326                      | NR            | 755    | 8                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 197                      | NR            | 630    | 294                      | NR            | 760    | 7                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 259                      | NR            | 635    | 261                      | NR            | 765    | 6                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 319                      | NR            | 640    | 232                      | NR            | 770    | 5                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 373                      | NR            | 645    | 204                      | NR            | 775    | 4                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 414                      | NR            | 650    | 179                      | NR            | 780    | 4                        | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 445                      | NR            | 655    | 157                      | NR            | 785    | 3                        | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 465                      | NR            | 660    | 136                      | NR            | 790    | 3                        | NR            | 920    | 0                        | NR            |
| 405    | 5                        | NR            | 535    | 482                      | NR            | 665    | 118                      | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 9                        | NR            | 540    | 493                      | NR            | 670    | 102                      | NR            | 800    | 2                        | NR            | 930    | 0                        | NR            |
| 415    | 18                       | NR            | 545    | 505                      | NR            | 675    | 87                       | NR            | 805    | 2                        | NR            | 935    | 0                        | NR            |
| 420    | 36                       | NR            | 550    | 515                      | NR            | 680    | 75                       | NR            | 810    | 2                        | NR            | 940    | 0                        | NR            |
| 425    | 72                       | NR            | 555    | 527                      | NR            | 685    | 65                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 134                      | NR            | 560    | 540                      | NR            | 690    | 56                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 242                      | NR            | 565    | 550                      | NR            | 695    | 48                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 407                      | NR            | 570    | 557                      | NR            | 700    | 41                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 684                      | NR            | 575    | 561                      | NR            | 705    | 35                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 988                      | NR            | 580    | 559                      | NR            | 710    | 30                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 828                      | NR            | 585    | 551                      | NR            | 715    | 26                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 473                      | NR            | 590    | 537                      | NR            | 720    | 22                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 333                      | NR            | 595    | 516                      | NR            | 725    | 19                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 232                      | NR            | 600    | 491                      | NR            | 730    | 16                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 146                      | NR            | 605    | 461                      | NR            | 735    | 14                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 113                      | NR            | 610    | 429                      | NR            | 740    | 12                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 106                      | NR            | 615    | 395                      | NR            | 745    | 10                       | NR            | 875    | 0                        | NR            |        |                          |               |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.73

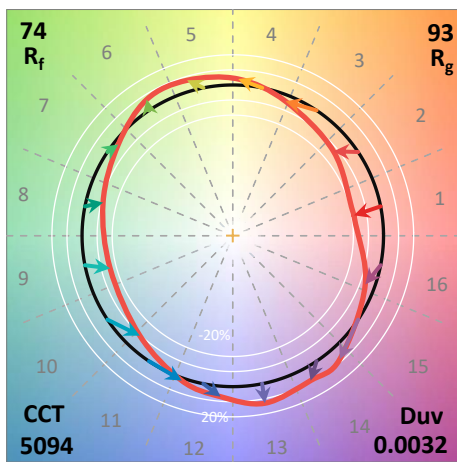
| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 114                      | NR            | 620    | 361                      | NR            | 750    | 9                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 145                      | NR            | 625    | 326                      | NR            | 755    | 8                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 197                      | NR            | 630    | 294                      | NR            | 760    | 7                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 259                      | NR            | 635    | 261                      | NR            | 765    | 6                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 319                      | NR            | 640    | 232                      | NR            | 770    | 5                        | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 373                      | NR            | 645    | 204                      | NR            | 775    | 4                        | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 414                      | NR            | 650    | 179                      | NR            | 780    | 4                        | NR            | 910    | 0                        | NR            |
| 395    | 1                        | NR            | 525    | 445                      | NR            | 655    | 157                      | NR            | 785    | 3                        | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 465                      | NR            | 660    | 136                      | NR            | 790    | 3                        | NR            | 920    | 0                        | NR            |
| 405    | 5                        | NR            | 535    | 482                      | NR            | 665    | 118                      | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 9                        | NR            | 540    | 493                      | NR            | 670    | 102                      | NR            | 800    | 2                        | NR            | 930    | 0                        | NR            |
| 415    | 18                       | NR            | 545    | 505                      | NR            | 675    | 87                       | NR            | 805    | 2                        | NR            | 935    | 0                        | NR            |
| 420    | 36                       | NR            | 550    | 515                      | NR            | 680    | 75                       | NR            | 810    | 2                        | NR            | 940    | 0                        | NR            |
| 425    | 72                       | NR            | 555    | 527                      | NR            | 685    | 65                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 134                      | NR            | 560    | 540                      | NR            | 690    | 56                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 242                      | NR            | 565    | 550                      | NR            | 695    | 48                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 407                      | NR            | 570    | 557                      | NR            | 700    | 41                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 684                      | NR            | 575    | 561                      | NR            | 705    | 35                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 988                      | NR            | 580    | 559                      | NR            | 710    | 30                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 828                      | NR            | 585    | 551                      | NR            | 715    | 26                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 473                      | NR            | 590    | 537                      | NR            | 720    | 22                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 333                      | NR            | 595    | 516                      | NR            | 725    | 19                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 232                      | NR            | 600    | 491                      | NR            | 730    | 16                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 146                      | NR            | 605    | 461                      | NR            | 735    | 14                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 113                      | NR            | 610    | 429                      | NR            | 740    | 12                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 106                      | NR            | 615    | 395                      | NR            | 745    | 10                       | NR            | 875    | 0                        | NR            |        |                          |               |

**Summary**

$R_f = 73.7$   
 $R_g = 93$   
 $CIE R_a = 72.0$   
 $R_9 = -39.6$



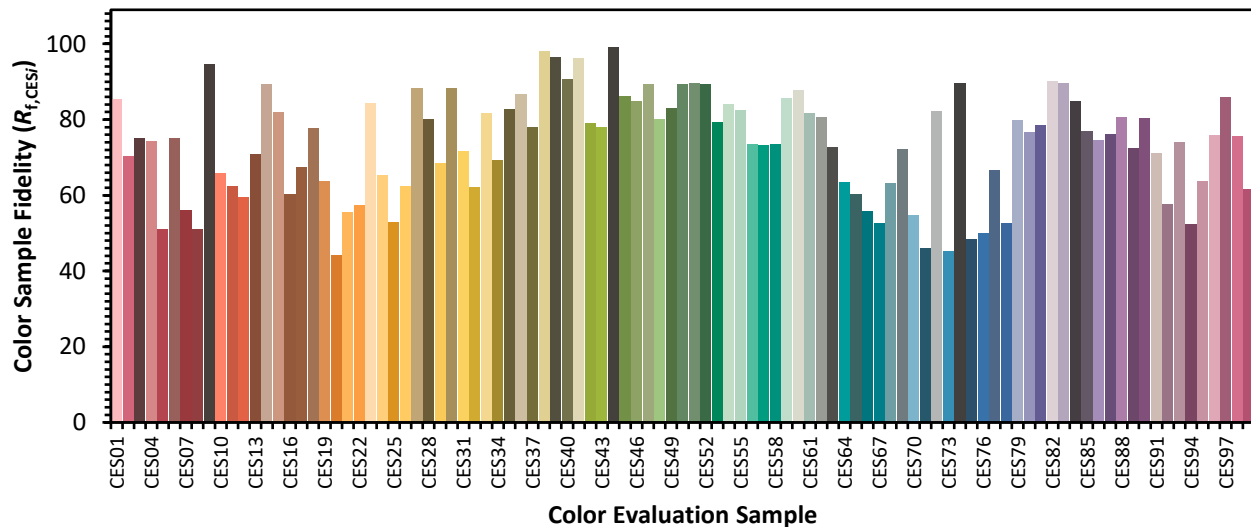
**Color Vector Graphics**





**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 62 | CES51 = 90 | CES76 = 50 |
| CES02 = 59 | CES27 = 88 | CES52 = 89 | CES77 = 67 |
| CES03 = 30 | CES28 = 80 | CES53 = 79 | CES78 = 53 |
| CES04 = 69 | CES29 = 69 | CES54 = 84 | CES79 = 80 |
| CES05 = 46 | CES30 = 88 | CES55 = 83 | CES80 = 77 |
| CES06 = 50 | CES31 = 72 | CES56 = 74 | CES81 = 78 |
| CES07 = 38 | CES32 = 62 | CES57 = 73 | CES82 = 90 |
| CES08 = 38 | CES33 = 82 | CES58 = 73 | CES83 = 90 |
| CES09 = 29 | CES34 = 69 | CES59 = 86 | CES84 = 85 |
| CES10 = 72 | CES35 = 83 | CES60 = 88 | CES85 = 77 |
| CES11 = 56 | CES36 = 87 | CES61 = 82 | CES86 = 75 |
| CES12 = 61 | CES37 = 78 | CES62 = 81 | CES87 = 76 |
| CES13 = 41 | CES38 = 98 | CES63 = 73 | CES88 = 81 |
| CES14 = 74 | CES39 = 96 | CES64 = 63 | CES89 = 72 |
| CES15 = 70 | CES40 = 91 | CES65 = 60 | CES90 = 80 |
| CES16 = 46 | CES41 = 96 | CES66 = 56 | CES91 = 71 |
| CES17 = 49 | CES42 = 79 | CES67 = 53 | CES92 = 58 |
| CES18 = 55 | CES43 = 78 | CES68 = 63 | CES93 = 74 |
| CES19 = 71 | CES44 = 99 | CES69 = 72 | CES94 = 52 |
| CES20 = 63 | CES45 = 86 | CES70 = 55 | CES95 = 64 |
| CES21 = 85 | CES46 = 85 | CES71 = 46 | CES96 = 76 |
| CES22 = 77 | CES47 = 89 | CES72 = 82 | CES97 = 86 |
| CES23 = 91 | CES48 = 80 | CES73 = 45 | CES98 = 76 |
| CES24 = 90 | CES49 = 83 | CES74 = 90 | CES99 = 62 |
| CES25 = 71 | CES50 = 89 | CES75 = 48 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)